

Effect Of Surgical Experience on Results of Esophagectomy for Esophageal Carcinoma

J.D. MILLER, MD, M.K. JAIN, MD, C.J. DE GARA, MD, D. MORGAN, MD, AND J.D. URSCHER, MD*

Divisions of Thoracic Surgery and Gastroenterology, Hamilton Regional Cancer Centre and McMaster University, Hamilton, Ontario, Canada

Background: Esophagectomy for esophageal cancer is associated with substantial operative morbidity and mortality. The effect of surgical experience on results of esophagectomy has received little attention in the medical literature.

Methods: A retrospective review of esophagectomies for cancer was done.

Results: Seventy-four patients underwent esophagectomy by 20 different surgeons. Three surgeons performed 6 or more esophagectomies per year ("frequent" surgeons), whereas the other 17 surgeons performed 5 or fewer esophagectomies per year ("occasional" surgeons). Forty-two patients were operated on by frequent surgeons. There were 3 (7%) anastomotic leaks and no deaths. In 32 patients operated on by occasional surgeons, there were 7 (22%) anastomotic leaks and 7 (22%) operative deaths. The anastomotic leak rates were not significantly different ($P < .07$), but frequent surgeons had a significantly lower operative mortality ($P < .0014$).

Conclusions: Esophagectomy for esophageal cancer should be performed by experienced esophageal surgeons with sufficient yearly volume of procedures to maintain competence.

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KEY WORDS: clinical competence; esophageal neoplasms, mortality; esophageal neoplasms, surgery; postoperative complications

INTRODUCTION

The outcome of esophagectomy for esophageal cancer has improved over the last three decades, but the operation still has a mortality of 10% and an even higher rate of major postoperative complications [1,2]. The effect of surgical experience on results of esophagectomy has received little attention in the medical literature [3]. For other complex operations, surgeon experience and patient volume are important predictors of postoperative complications [4–7]. This type of information is increasingly important. It has implications for health care planning, regionalization of services, and credentialing of practitioners [8,9]. To determine the effect of surgical experience on postoperative results of esophagectomy for esophageal carcinoma, we conducted a retrospective review.

MATERIALS AND METHODS

The Hamilton Regional Cancer Centre maintains records of all cancer patients treated in the Hamilton-Wentworth region of Ontario, Canada. Over a 4-year period (1989–1993), 281 patients diagnosed with esophageal cancer were identified. Esophagectomy was performed on 74 patients, who form the basis of this study.

Records were analyzed for surgical personnel, stage and location of tumor, operative mortality, and anastomotic leakage. Of the various complications that occur

*Correspondence to: John D. Urschel, M.D., Thoracic Surgical Oncology, Roswell Park Cancer Institute, Elm and Carlton Streets, Buffalo, NY 14263-0001. FAX: 716–282–4186.

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after esophagectomy, anastomotic leakage is particularly influenced by surgical technique [10]. In addition, anastomotic leakage can be accurately quantified in a retrospective review. A Chi-square test was used for statistical analysis, and a $P < .05$ was considered significant.

RESULTS

Seventy-four patients underwent esophagectomy for esophageal cancer with an overall operative mortality of 9.5%. The operations were done by 20 different surgeons. Three surgeons performed 6 or more esophagectomies per year ("frequent" surgeons); the other 17 surgeons performed 5 or fewer per year ("occasional" surgeons). Forty-two patients were operated on by frequent surgeons, and the other 32 patients had esophagectomies done by occasional surgeons.

Location of the tumor was similar for both groups. In the frequent group, there were 11 middle, 14 lower, and 17 gastroesophageal junction tumors. In the occasional group, there were 2 middle, 11 lower, and 19 gastroesophageal junction tumors. Stage of cancer was also similar for the two groups (frequent: stage I—4, IIa—8, IIb—15, III—14, IV—1; occasional: stage I—1, IIa—10, IIb—10, III—11, IV—0).

In 42 patients operated on by frequent surgeons, there were 3 (7%) anastomotic leaks and no deaths. In 32 patients operated on by occasional surgeons, there were 7 (22%) anastomotic leaks and 7 (22%) operative deaths. The anastomotic leak rates were not significantly different ($P < .07$), but frequent surgeons had a significantly lower operative mortality ($P < .0014$).

DISCUSSION

The effect of surgical experience on operative mortality has recently been emphasized in several studies of complex surgical procedures. In cardiac, aortic aneurysm, and pancreatic surgery, complications and operative mortality are inversely related to surgeon experience and patient volume [4–7]. This relationship was intuitively obvious to surgeons for many years, but recent changes in health care delivery in North America have created a need to document this information.

One study of esophagectomy for esophageal cancer showed an inverse relationship between surgeon experience and operative mortality [3]. However, the study period spanned from 1957 to 1976, and operative mortality for both experienced and inexperienced surgeons was prohibitive by today's standards (frequent—21.6%, occasional—39.4%). Operative mortality for esophagectomy has fallen over the past several decades [1,2]. The

overall mortality of 9.5% in our series is comparable to other recently published data [2]. This present study is the first specifically to investigate the relationship between surgeon experience and operative results in the modern era. It shows that experienced esophageal surgeons have a lower operative mortality for esophagectomy than occasional esophageal surgeons.

Surgical training and operative experience were closely related variables in this study. The three "frequent" surgeons were trained in both general surgery and thoracic surgery. In Canada, thoracic surgery is a separate specialty from cardiac surgery, and most trainees have extensive exposure to esophageal cancer surgery in their residencies. However, esophageal surgery is a subspecialty of general surgery in many parts of the world. Irrespective of specialty designations, the importance of thorough training in esophageal cancer surgery cannot be overemphasized.

Health care delivery is rapidly changing in both Canada and the United States. Canadian provincial governments are reducing global spending on health care. In the United States, health care spending is being reduced by "managed care" programs. Issues raised in this report, and other related publications, have implications for regionalization of surgical services and credentialing of surgeons for performance of complex operative procedures [7–9].

REFERENCES

1. Earlam R, Cunha-Melo JR: Oesophageal squamous cell carcinoma: I. A critical review of surgery. *Br J Surg* 1980;67:381–390.
2. Muller JM, Erasmi H, Stelzner M, et al.: Surgical therapy of oesophageal carcinoma. *Br J Surg* 1990;77:845–857.
3. Matthews HR, Powell DJ, McConkey CC: Effect of surgical experience on the results of resection for oesophageal carcinoma. *Br J Surg* 1986;73:621–623.
4. Katz DJ, Stanley JC, Zelenock GB: Operative mortality rates for intact and ruptured abdominal aortic aneurysms in Michigan: An eleven-year statewide experience. *J Vasc Surg* 1994;19:804–817.
5. Kazmers A, Jacobs L, Perkins A, et al.: Abdominal aortic aneurysm repair in Veterans Affairs medical centers. *J Vasc Surg* 1996;23:191–200.
6. Yeo CJ, Cameron JL, Maher MM, et al.: A prospective randomized trial of pancreaticogastrostomy versus pancreaticojejunostomy after pancreaticoduodenectomy. *Ann Surg* 1995;222:580–592.
7. Sirio CA, Jones J: Evaluating outcomes in cardiac care and developing consensus for action: The Pennsylvania Health Care Cost Containment Council experience. *Am J Med Qual* 1996;11: S30–S34.
8. Grumbach K, Anderson GM, Luft HS, et al.: Regionalization of cardiac surgery in the United States and Canada: Geographic access, choice, and outcomes. *JAMA* 1995;274:1282–1288.
9. Green J, Wintfeld N: Report cards on cardiac surgeons: Assessing New York State's approach. *N Engl J Med* 1995;332:1229–1232.
10. Urschel JD: Esophagogastronomy anastomotic leaks complicating esophagectomy: A review. *Am J Surg* 1995;169:634–640.